

An assessment of the face on Turkish and African students.

Musa Acar^{1*}, Senay Burcin Alkan², Mahinur Ulusoy³, Yasemin Akkubak¹

¹Department of Physical Therapy and Rehabilitation, Faculty of Health Sciences, Necmettin Erbakan University, Konya, Turkey

²Department Nutrition and Dietetics, Faculty of Health Sciences, Necmettin Erbakan University, Konya, Turkey

³Department of Anatomy, Faculty of Medicine, Beykent University, Turkey

Abstract

Introduction: Calculating the values about the human body dimensions and evaluating them is possible by physical anthropometry. Those values are affected by the factors such as ecological, biological, geographic, racial, gender and age.

Method: This study has been carried out on 40 (20 male, 20 female) Turkish and 40 (20 male, 20 female) African students whose ages differed between 18-25 studying in the University of Mevlana and University of Necmettin Erbakan. In the research, the individuals who had been identified with a morphological deformation had a major trauma and plastical or reconstructive surgeries are excluded. The parameters for measurement have been determined as; eye-fissure width (right), eye-fissure width (left), intercanthal distance, outercanthal distance, nose width, nose height, mouth width.

Results: Morphometric parameters belonging to both race males and female ears were compared between genders. Right and left tragus-helix and tragus-antihelix distance of Turkish male individuals were founded significantly lower than African male individuals, right and left lobular width and lobular height were founded significantly higher than African male individuals ($p<0.05$). Left and right ear length of Turkish female individuals, lobular width and left lobular width were founded significantly higher than African Female individuals ($p<0.05$).

Conclusion: Consequently, the values we obtained are important for establishing a referential gap between the individuals of Turkish and African races. Also we are of the opinion that those values will be useful to the anatomists in the anatomical education and to the aesthetic surgeons and dentists.

Keywords: Nose, Antropometry, Face

Accepted on February 17, 2017

Introduction

Calculating the values about the human body dimensions and evaluating them is possible by physical anthropometry. Those values are affected by the factors such as ecological, biological, geographic, racial, gender and age [1]. The head has an extremely complex structure. Inside it, not only contains the brain, but other structures such as the eye, ear and mouth [2].

One of the most important components of the orthodontics diagnosis and treatment planning is evaluating the patient's facial soft tissues. The dimension and shape of the facial soft tissue is used frequently in the postoperative evaluation and diagnosis and treatment planning in the various medical domains like orthodontics, maxillofacial and plastic surgery. Obtaining the facial soft tissue measurements is important in terms of reaching the aesthetic criterion. Alongside with the surgical developments, the harmony of the face has been considered as one of the treatments aims [3].

The aim of this study to compare two different races and genders and establishing a reference range both races.

Materials and Methods

This study has been carried out on 40 (20 male, 20 female) Turkish and 40 (20 male, 20 female) African students whose ages differed between 18-25 studying in the University of Mevlana and University of Necmettin Erbakan. In the research, the individuals who had been identified with a morphological deformation had a major trauma and plastically or reconstructive surgery are excluded.

Our study has been planned on three phases as collecting the data, statistical analysis and comparing the results with the literature. The parameters for measurement have been determined as; eye-fissure width (right), eye-fissure width (left), intercanthal distance, outercanthal distance, nose width, nose height, mouth width (Figure 1).

80 students have been chosen among the university students at the first phase randomly. In order to minimize the risk of accident, the measurements were done by the same researcher by the electronical milimetric caliber. And all measurements made by placing individual on the supine position.

The data obtained at the second phase was evaluated through the t-test.

At the third and the last phase the study has finished by comparing our data and the data of the literature.

Ethics committee report received from Necmettin Erbakan University and this study conformed to the Helsinki Declaration.

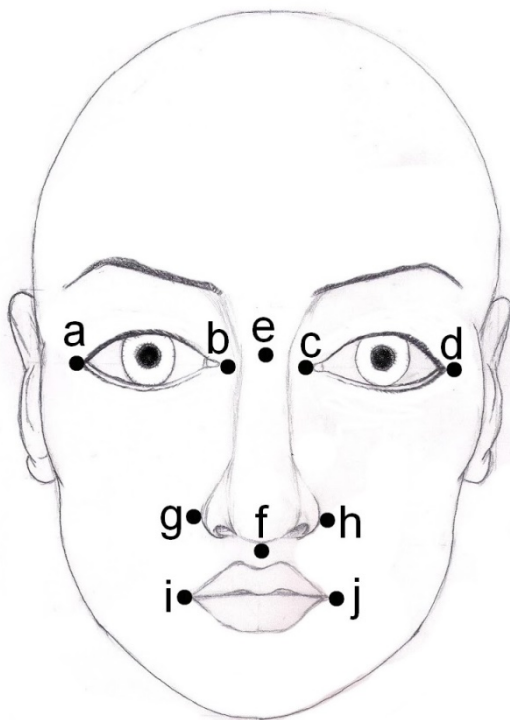


Figure 1. Anthropometric measurements: eye-fissure width (right)/ab, eye-fissure width (left) /cd, intercanthal distance/bc, outer canthal distance/ad, nose width/gh, nose height/ef, mouth width/ij.

Results

Some morphometric parameters of the individuals participated in the study are compared (Table 1). The left eye width and nose height of the Turkish male individuals have been found to be higher to a significant degree compared to the African individuals ($p < 0.05$). The nose height of the Turkish female individuals have been found to be higher to a significant degree compared to the African individuals ($p < 0.05$). The nose width of the African female individuals have been found to be higher to a significant degree compared to the Turkish individuals ($p < 0.05$).

Some morphometric parameters of the same race male and female individuals are compared (Table 2). The right-left eye width of the African women, their outer canthal distances, nose

width and mouth width have been found to be significantly higher compared to the African male individuals ($p < 0.05$). The nose height of the African male individuals have been found to be higher to a significant degree compared to the African female individuals ($p < 0.05$).

The nose height of the Turkish male individuals have been found to be higher to a significant degree compared to the Turkish female individuals ($p < 0.05$).

Discussion

The face is the art which varies most of the body. It varies even among the family members alongside with the conditions such as race, ethnic group, gender, geographical conditions [4,5]. Depending on that, the anthropometric studies are generally on the race, age, gender and specific geographical conditions [1]. Osuobeni et al. studies the eye width were registered at the right, as 29.77 ± 2.15 mm and as 29.85 ± 2.12 mm at the left side. The eye width in our study, have been identified at the Turkish males as 33.1 ± 2.5 mm at the right side, 33.8 ± 2.2 mm at the left side, for the Turkish women, as 34.5 ± 2.9 mm at the right and 34.5 ± 2.1 mm at the left. It was registered to be 32.7 ± 2.2 mm for the African males, 31.9 ± 2.6 at the left side, for the African females 35.4 ± 2.4 mm at the right side, 33.3 ± 2.2 mm at the left. The values we found in our study have been higher than those identified by Osuobeni et al. [6].

The ocular hypertelorism, is the distance more than normal between the oculars, and the ocular hypotelorism is to be less than normal. The ocular hypertelorism is seen along with some craniofacial abnormalities [6]. At a study carried out before the intercanthal distance was found at males as 32.35 ± 3.2 mm, and 31.4 ± 2.5 mm at females [3]. Again in another study this distance have been indicated to be 33.17 ± 2.79 mm at males, 31.86 ± 2.36 mm at females [7]. At our study the intercanthal distance have been identified to be 32.1 ± 2.8 mm with Turkish males, 33.3 ± 3.1 mm with Turkish females. At the African males it was registered as 30.5 ± 4.8 mm and 32.0 ± 2.8 mm with the African females. The values we found are in accordance with the ones found in the literature.

The outer canthal distance in the 14 and arc studies were registered to be 111.5 ± 8.3 mm with males, 101.1 ± 8.1 mm with females. Again in another study this distance have been indicated to be 99.74 ± 5.47 mm at males, 96.51 ± 4.73 mm at females [7]. At our study the outer canthal distance have been identified to be 96.6 ± 15.9 mm with Turkish males, 99.5 ± 4.8 mm with Turkish females. At the African males it was registered as 97.7 ± 7.1 mm, and 102.3 ± 6.0 mm with the African females.

The aesthetical analysis of the face is an important phase of the treatment planning in the orthodontic and facial aesthetic surgery. Knowing in details some parameters which vary depending on the age, sex and race, plays an important role in obtaining a normal face and obtaining successful results from the treatment [8]. In a study the nose width was indicated to be 34.7 ± 2.6 mm with males and 31.4 ± 1.9 mm with females [9]. Omur et al. studies, the nose width were registered to be 35.2

mm. This value has been registered in our study to be 34.7 ± 2.1 mm with Turkish males, 33.8 ± 2.3 mm with Turkish females, 34.4 ± 6.6 mm with the African males, 39.4 ± 4.1 mm with the African females. The obtained values have been found to be significantly high with the African females.

The analysis of the human face is an art which makes use of both the aesthetic and anthropological tools [3]. At the studies of Vahid, the nose height was measured and this value was indicated to be 50.52 ± 2.84 mm with males 48.32 ± 3.5 mm with females. This value has been registered in our study to be 54.3 ± 3.9 mm with Turkish males, 48.8 ± 3.6 mm with Turkish females, 50.4 ± 5.3 mm with the African males, 42.6 ± 5.4 mm with the African females. At our nose length study, the differences were found both between the genders and the races in a significant manner.

One of the most important components of the orthodontix diagnosis and treatment planning is evaluating the patient's

facial soft tissues. Obtaining the facial soft tissue measurements is also important in terms of reaching the aesthetic criterion. In a study in the literature the mouth width has been indicated to be 51.55 ± 4.06 mm with males, and 48.88 ± 3.92 mm with females [7]. In another study the mouth width was registered as 55.9 ± 4.9 mm with males and 52.6 ± 5.0 mm with females [10]. This value has been identified in our study to be 51.9 ± 3.7 mm with Turkish males, 52.4 ± 3.1 mm with Turkish females, 49.5 ± 5.2 mm with the African males, 53.6 ± 3.4 mm with the African females.

Consequently, the values we obtained are important for establishing a referential gap between the individuals of Turkish and African races. Also we are of the opinion that those values will be useful to the anatomists in the anatomical education and to the aesthetic surgeons and dentists.

Table 1. Comparison of the obtained data according to gender (mean \pm SD) (mm).

Parameters	Male		p	Female		p
	Turkish	African		Turkish	African	
EFW(r)	33.1 ± 2.5	32.7 ± 2.2	P>0.05	34.5 ± 3.0	35.4 ± 2.5	P>0.05
EFW(l)	33.8 ± 2.2	31.9 ± 2.6	P<0.05	34.6 ± 2.1	35.4 ± 2.3	P>0.05
ID	32.1 ± 2.8	30.5 ± 4.8	P>0.05	33.3 ± 3.1	32.0 ± 2.8	P>0.05
OD	96.6 ± 15.9	97.7 ± 7.1	P>0.05	99.5 ± 4.8	102.3 ± 6.0	P>0.05
NW	34.7 ± 2.1	34.4 ± 6.6	P>0.05	33.8 ± 2.3	39.4 ± 4.1	P<0.01
NH	54.3 ± 3.9	50.4 ± 5.3	P<0.05	48.8 ± 3.6	42.6 ± 5.4	P<0.01
MW	51.9 ± 3.7	49.5 ± 5.2	P>0.05	52.4 ± 3.1	53.6 ± 3.4	P>0.05

r: Right; l: Left; EFW: Eye-Fissure Width; ID: Intercanthal Distance; OD: Outercanthal Distance; NW: Nose Width; NH: Nose Height; MW: Mouth Width

Table 2. Comparison of the obtained data according to race (mean \pm SD) (mm).

Parameters	Turkish		p	African		p
	Male	Female		Male	Female	
EFW(r)	33.1 ± 2.5	34.5 ± 2.9	P>0.05	32.7 ± 2.2	35.4 ± 2.4	P<0.01
EFW(l)	33.8 ± 2.2	34.5 ± 2.1	P>0.05	31.9 ± 2.6	33.3 ± 2.2	P<0.01
ID	32.0 ± 2.8	33.3 ± 3.1	P>0.05	30.5 ± 4.8	31.9 ± 2.8	P>0.05
OD	96.6 ± 15.9	96.4 ± 4.8	P>0.05	97.7 ± 7.1	102.3 ± 6.0	P<0.05
NW	34.7 ± 2.1	33.8 ± 2.3	P>0.05	34.4 ± 6.6	39.4 ± 4.1	P<0.01
NH	54.3 ± 3.9	48.9 ± 3.6	P<0.01	50.4 ± 5.3	42.6 ± 5.4	P<0.01
MW	51.9 ± 3.7	52.4 ± 3.1	P>0.05	49.5 ± 5.2	53.6 ± 3.4	P<0.01

r: Right; l: Left; EFW: Eye-Fissure Width; ID: Intercanthal Distance; OD: Outercanthal Distance; NW: Nose Width; NH: Nose Height; MW: Mouth Width

References

1. Jahanshahi M, Golalipour MJ, Heidari K. The effect of ethnicity on facial anthropometry in Northern Iran. *Singapore Med J* 2008; 49: 940-943.
2. Chiarella SF, Virgilio F. Soft-tissue facial anthropometry in three dimensions: from anatomical landmarks to digital morphology in research, clinics and forensic anthropology. *J Anthropol Sci* 2006; 84: 97-124.
3. Vahid M, Fathinejad S, Pakizeh Z, Shamsa M, Golkari A. Photographic facial soft tissue analysis by means of linear and angular measurements in an adolescent persian population. *Open Dent J* 2015; 9: 346-356.
4. Julian BW, Igarashi T, Dong J. Faculty-supervised measurements of the face and of mandibular movements on young adults. *J Adv Prosthodont* 2014; 6: 483-490.
5. Prasanna LC, BhosaLe S, D'souza AS, Mamatha H, Thomas RH, Sachin KS. Facial indices of North and South Indian adults: reliability in stature estimation and sexual dimorphism. *J Clin Diagn Res* 2013; 7: 1540-1542.
6. Osuobeni EP, Al-Gharni SS. Ocular and facial anthropometry of young adult males of Arab origin. *Optom Vis Sci* 1994; 71: 33-37.
7. Ömür K, Gülçen B, Kuş MA, Elmalı F, Kuş İ. Morphometric facial analysis of turkish adults. *Balikesir Saglik Bil Derg* 2012; 1 : 7-11.
8. Salah M, Higzi MA, Ali RW, Naini FB. The Sudanese female face: normative craniofacial measurements and comparison with African-American and North American White females. *J Craniomaxillofac Surg* 2014; 42: 1704-1709.
9. Leslie GF, Marko BA, Christopher RF. International anthropometric study of facial morphology in various ethnic groups/races. *J Craniomaxillofac Surg* 2005; 16: 615-646.
10. Sforza C, Dolci C, Tommasi DG, Pisoni L, De Menezes M, Elamin F. Three-dimensional facial distances of Northern Sudanese persons from childhood to young adulthood. *J Craniomaxillofac Surg* 2014; 42: 318-326.

*Correspondence to

Musa Acar
Department of Physical Therapy and Rehabilitation
Faculty of Health Sciences
Necmettin Erbakan University
Turkey